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Wuaiili: the nut is a little larger than koua and has a dark green husk.
Uivaka: the immature nut has grown still larger but is still not used as food. Children use nuts at this stage as crude dolls.
Moto katia: the husk is well formed; the cavity is filled with a clear fluid which is bitter and undrinkable; no flesh has yet formed. If the husk is flicked with the fingers it gives off a hollow resonance.
Mukomuko: a thin, slimy, easily detachable flesh begins to form over the inner surface of the nut. The mukomuko flesh forms inside the mesocarp at the point of attachment of stalk to nut. When the green outer husk is stripped off, the edible husk is exposed—a white, meaty substance around the outside of the eyes. Mukomuko from certain trees (niu melo, niu kawa kenakena, and niu uyi) is sweeter and more desirable than others. The fluid from the advanced mukomuko nut may be drunk but is more often added to talo puddings.
Niu katikati: the shell is harder, the flesh thicker though still slimy. The liquid ceases to be bitter and may be drunk.
Niu mata motomoto: the drinking nut in its earlier stage. The liquid is not so sweet as in the next stage. The flesh is soft and thick and is eaten after the liquid is drunk. The husk is dry and unfit for food.
Niu mata: drinking nut at its best stage. The liquid is sweet (leka) and the flesh tasty (malie). When this nut is shaken, the liquid inside can not be heard.
Niu mata matua: the nut a little past its best drinking stage. The flesh has become hard, especially about the base of the nut; but the liquid is plentiful and sweet.
Niu kaka: the flesh is thick and hard; there is less fluid. The husk is darker than the niu mata, and the liquid rattles inside the shell when shaken. It is not particularly desired as food, but the liquid is drunk and the flesh eaten if the nut is husked. A nut at this stage is normally allowed to develop into a yakali nut. The flesh is specially used now as pig food.
Niu uli: the husk turns brown; the liquid becomes slightly bitter and the flesh hard. The embryo develops.
Niu papaku (modern name, yakali): The flesh (ipiipi) is mature, thick, and hard. Liquid is bitter and unfit to drink. The embryo has developed into an absorbing organ. This is the stage used in copra making. The ipiipi flesh is eaten with fish or other foods in the absence of talo; from it coconut cream (lolo) is made.

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Uto: the yakali nut left on the ground to germinate becomes filled with the spongy absorbing organ (uto). The liquid is absorbed and the flesh (ipiipi) is very thin or entirely absorbed. Leaves, stem, and roots develop. The uto is an important everyday food.
Takataka: stored yakali nuts. The embryo is undeveloped; the flesh thick, hard, and sweet; there is no fluid. After 6 months' storage, when the nut is dry but the flesh still fairly soft, the nuts are said to be mamaya. After a year the flesh changes its color from white to yellow-brown and the nut is described as koa ata (coloring). After 3 years the flesh is brown or red and the nut is described as koa kula (red-brown). The flesh is eaten by itself or as a food complement (kinaki) to pandanus fruit or edible mukomuko. It is also used in the preparation of coconut oil.

257 *Takataka* nuts are stored on the high platform of a storage house (*vale takataka*) in one of two ways:

In the first method the yakali nuts may be left unhusked (*uvi kaawa*) so that rats can not bite through the husk to the flesh within. The drying process hardens and strengthens the husk fibers which are later soaked in salt water and used to make sennit. By the second storage method the yakali nuts are husked and a piece of *punga* coral of appropriate size is driven into each eye of the nut, effectively closing the eyes so that rats cannot gnaw through the shell. Nuts are stored for five years or more

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according to the quality of *takataka* desired. An excellent food reserve against hard times, households formerly had one or several houses stored exclusively with *takataka* nuts.

The various parts of the coconut are named as follows:

Mata: eyes of the nut.
Mulimuli: base of nut opposite eyes.
Pulu: husk.
Pulu kawa: husk fibers.
Kiko: endosperm when soft.
Ipiipi: endosperm when hard.
Ngaipu, plural na ngaipu: endocarp (shell).
Uto: absorbing organ.
Yua: coconut liquid.
Kanava: fatty deposit on surface of flesh of yakali nut.
Tuatua: brown sheath separating flesh from shell in yakali nut.
Uto wai kawa: unhusked nut at uto stage.
Uto: husked nut at uto stage.
Kili uto: sheath between hard endosperm and absorbing organ.
Mata uto: sprouting stem, radicle and roots together.

## Harvesting

The three articles used in harvesting and husking coconuts—climbing bandage, husking stick, and carrying pole—are all described elsewhere (pp. 123, 146).

In coconut-tree climbing, the right arm is passed around the trunk of the tree and holds the body close to the trunk. The flexed left arm grips the near surface of the trunk and is used to lever the body as the climber progresses up the tree with a series of short springs. Alternatively, both arms are passed around the trunk of the tree, but the former method is preferred where speed is desired.

Throwing nuts down from the tree is termed *mako te niu ki lalo, totoli te niu ki lalo*, or *takavili te niu*. Nuts are usually harvested by young boys, occasionally by girls. The nut is grasped with the hand from below and twisted off the stem. As the nut is released, the hand is given a rotary twist (*lui*) so that the nut spins around as it falls and drops in a vertical line. It hits the ground on the base of the nut and does not split open with the impact. The spin also prevents the nut from rolling when it hits the ground and so becoming lost in the undergrowth.

Whenever a special gift of nuts is to be made, the nuts are lowered in a cluster from the tree, so that none will be bruised. They are given to the recipient unhusked. Besides receiving a gift with this special mark of status, the recipient receives also the edible husk of the nut.

From 20 to 40 nuts are usually harvested at one time. The husking stick (*koyo*) is next set up.

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252 11. *Wawa tunu pakapaka.* Peeled corms are placed on heated oven stones (*inna ni pu*, the oven that has been burned) and allowed to cook for an hour or more. They are served with *ipüpi*.

12. *Wawa tukituki tunu. Wawa tunu pakapaka* is placed in a bowl, grated *yakali* nut flesh is added, and both are pounded until well mixed. *Lolo* is added to the mixture and the food is served in shells. The dish is considered very rich and is not often made.

13. *Pikopiko.* Very small, young talo cormlets (*pikopiko*) are peeled with the fingers. The cormlets and their petioles are broken into small pieces, placed in banana and *puapua* leaves, covered with *lolo*, and baked.

14. *Pota ulukau.* The outer skin (*kili*) of talo petioles is stripped off. The petioles and young leaves are shredded into small pieces, wrapped in *puapua* leaves, and baked. The food is then placed in a bowl, grated *ipüpi* (*ota*) is sprinkled over it, and the whole pounded together. Coconut water is added and the food served in *ipu*.

15. *Pota ulukau puaka.* When available, layers of pork fat are alternated with layers of petioles and leaves, and the whole baked in leaves. Before serving, *lolo* is poured over the food to make a rich, flavorsome dish.

16. *Tingapula.* Young talo petioles are peeled, broken into small pieces, and placed on *puapua* leaves. *Lolo* is added, the packet tied as for *loloi*, and baked.

262 252 *Pulaka* is considered less tasty than talo and is only eaten when the flavor of talo becomes tiresome or when talo supplies are low. Most of the dishes made from talo are also made with *pulaka*, excepting *pikopiko*, *poke*, and *pota ulukau*. The talo dish called *lulu* becomes *tao paku pulaka* when made with *pulaka*; otherwise the names are the same, for example, *loloi pulaka* and *mawu pulaka*.

251 Uncooked talo is buried in the ground near the cook house for preservation. It will keep thus without rotting for about three weeks. Talo brought from Motu Ko in large quantities is treated in this way. Cooked talo or fish, left over from one day to the next, is preserved by baking in a fresh oven. It is placed in the oven overnight or kept in a basket tied to the cook house rafters overnight and placed in the oven on the next day. Large talo puddings have been known to be kept for a week or more without the *lolo* in them curdling (*vi*), simply through being rebaked day after day, though after much rebaking the puddings get hard and lose flavor. The 251 unusual thing about such preservation is that the puddings should remain 261 so long uneaten. This occurred however after island fishing feasts. One family got a very large share of talo from the division and then had a very bad week for fish, catching practically none. Without fish for a food complement, they could not eat the pudding and so kept on preserving it in the hope that the men of the household would soon get fish.

251 For rebaking, talo puddings are either wrapped in *pulaka*, banana, or *puapua* leaves (*yawi ki te lau pulaka ma*), or tied up in coconut leaflets (*takai ki te launiu*). The leaflet packet is preferred when a well-browned pudding is desired. Pairs of coconut leaflets are stripped from the midrib. One leaflet is twisted lengthwise round the packet, the second widthwise, and the packet fastened securely. To make them more pliable, the leaflet ends may be first heated over a fire.

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### OTHER PLANT FOODS

No origin myth is remembered for pandanus. Though it is not cultivated, pandanus grows abundantly. The keys (*penu*) may be eaten raw when ripe, with or without complement (*kinaki*). They may be sliced and baked (*wala tao*) and eaten with *ipiipi*. Grated raw and added to talo puddings (*olo wala* and *likoliko wala*) they give a sweet flavor. The juice of baked keys (*makano*) is used in the same way. The fruit is enjoyed by adults and children and provides an important flavoring and sweetening agent in the native diet. Children crack open the keys and chew the inner kernel. The woman in the moon, Yina, is said to be seen kneeling before a stone cracking open pandanus keys.

The banana was among the items fished up by Maui. Of the several varieties of banana (*wuti*) growing on the island today, *wuti pukapuka* is said to be old and indigenous. The trunk of the tree is called *pu wuti*. *Lito* is a small banana leaf; *lawwuti*, a large leaf, used extensively in cooking as a food wrapper; *laumatu*, the old, dried, and withered leaf; *kau*, the leaf midrib; *kili*, the fruit peel; *kiko*, the flesh. Bananas are not abundant on the atoll and are not important in the daily diet. They grow in the talo beds and close to the houses. When available, they are much in favor as gifts. A household may get a small bunch of fruit from its trees once in five or six months. Bananas are ripened by hanging or by burying. A bunch (*to*) of green fruit is cut and buried in a hole in the ground 2 feet deep and lined with coconut husks. The bananas are placed on a bed of husks and covered with coconut mats (*polapola*), then more husks, and finally with earth. After three nights the bananas are ripe and are eaten raw or cooked on hot stones. If a meal is made of bananas the correct complement is *ipiipi*.

Some sugar cane (*to*) is grown today on the talo bed embankments. It is owned by the villages and at infrequent intervals is divided among all village members. The cane is peeled with the teeth and chewed by children and adults with great delight. The cane is *pona*; the rings around the cane, *vu*. The few papaya trees (*sinita*) and lime trees (*tipola*) are grown on Motu Kotawa and the fruits divided among all members of Yato village. One breadfruit tree on the atoll was planted by a man from Aitutaki. Its yield of fruit is negligible.

### FLESH DIET

There were two staple flesh foods in former times, sea foods (fish, turtle, shellfish, crabs) and sea birds. (See pp. 27-31.)

No tapu against the eating of raw fish exists in Pukapuka, though visitors from Aitutaki have unsuccessfully tried to introduce the idea. Actually fish is not often eaten raw. A fishing crew occasionally eats some

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of the catch raw to stave off pangs of hunger. *Kakai, pala,* and other big fish that are particularly tasty raw are usually caught on Saturday and must be saved and cooked for the Sunday feast. *Ava* (milk mullet), a small fish tasty when raw, is caught only by Yato village from its pond and is generally baked for village food divisions.

Large fish are split before cooking into four longitudinal quarters (*io*) by cutting along the longitudinal black blood canal and dividing each half into two. In the fore sections of the two bottom *io* is the choice part of the flesh called *pakoko* (fig. 7). It is fat and tasty and much preferred by pregnant women.

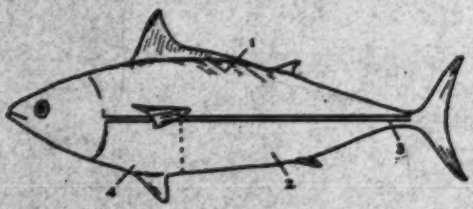


FIGURE 7.—Division of albacore fish: 1, upper sides, *io;* 2, bottom sides, *io alonga;* 3, dark-colored blood canal; 4, fat portion of flesh (*pakoko*) esteemed as special delicacy.

Small fish are not cleaned or scaled (*wolowolo*) before cooking. Larger fish are roughly scaled by working the thumb along the skin from the tail to the head. Head, fins, and internal organs are not removed. Every part of a fish is eaten.

Only two methods are used for cooking fish: grilling (*tunu*) and oven-baking (*tao*). Fish to be eaten immediately are always grilled; fish to be eaten later in the day or on the next day are baked. For grilling large quantities of fish, a special fire is always built, even though another fire is already burning in the cook house. The grilling fire is built only of coconut shells (*ngaipu*) of the *yakali* or *uto* stage, which burn with a clear, fierce flame. The fish are laid on the glowing embers and turned from time to time until cooked. Small fish, particularly *keloma,* are spitted on a coconut leaflet midrib, about 20 fish on each midrib, with all the heads facing one way and all the tails facing the other. They are grilled thus.

When there is a larger supply of fish on hand than can be immediately eaten, fish is preserved by sun-drying (*wakala hi te la ke pakapaka*). Fish that has been dried for several days will last indefinitely. Large fish—*kakai, pala,* and *atu*—are first split into the usual four sections and twice oven-baked. Each section is then cut into smaller pieces, placed on *laulau* food platters, and hung from house eaves to dry in the sun. During the flying-fish season when there is an abundance of fish, flying fish are partially grilled on hot stones and then sun-dried. They keep for a long time without spoiling.

Turtle flesh is grilled. The only correct complement for turtle in former days was a taro dish. It was taga to eat coconut with turtle. A man named Yawenga broke this rule, so the story goes, and the next time he went turtle fishing he was caught by a male turtle, which sounded and drowned Yawenga and then took his body to the legendary land called Valu Wetuna. It is likely that this taga against mixing turtle flesh and coconut is associated with the displeasure of the turtle when the woman Vina broke a coconut on his head. Turtle ova (*ovao*) are eaten as well as the meat, fat, and carapace, raw or grilled. Probably turtle eggs were not eaten formerly but were left to hatch, an inference from informants' statements that it is only in recent times, since people have taken the eggs of the turtle from the nest, that turtles have been dying out.

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*Tridacna* shellfish (*payua*) are eaten raw or mixed with coconut cream and baked in leaves in the oven. Persons especially fond of them collect large quantities which they preserve for future use or for periods of want by stringing them on coconut midrib fibers (*kalava*), 30 to 40 *payua* on each string. The strung *payua* are baked for a day or overnight and then hung from house eaves to dry in the sun for about 10 days. Thereafter they are placed in baskets and stored until wanted.

Wild birds are not preserved in any way. They are grilled and eaten immediately after they are caught. A bird is plucked at the beach and the feathers allowed to drift anywhere. Head and claws are left attached to the body and the bird is not gutted or cleaned in any way. A length of green coconut midrib, thrust down the throat of the bird and into its stomach, is used to hold the bird over the flames and embers of a fire made of *ngoipu* coconut shells until it is suitably grilled. All the bones are picked clean; the internal organs with the small fish and seaweed in the stomach bag and intestines are considered especially tasty morsels.

The pig (*puaka*) and the chicken (*moa*) were introduced after white contact. The pig, brought by early missionaries, is eaten today only at feast times or in food divisions to pay workers for services.

A pig is led down to the beach and allowed to wallow in the sea to clean its skin before it is killed by choking. A stout stick is placed across the throat of the animal lying on its back with its legs held or tied. Men stand on each end of the stick until the animal is dead. The dead beast is singed (*mumula*) with flaming coconut leaves and the skin scraped (*vuluvulu*) with a coconut shell. It is washed (*palupalu*) again in the sea so that the skin is clean (*makitakita*). The animal is then placed on a bed of coconut leaves laid on the ground. The stomach is opened up, the internal organs (*ngakau*), heart and liver, are removed and washed in the sea. The blood is caught in coconut cups and baked in them (*toto momoyo*, cooked blood). The intestines are grilled on hot stones; the liver and heart are wrapped in banana leaves and oven-baked. The whole pig is baked in an oven for 4 or 5 hours, according to the size of the animal, and then butchered and shared among the participants in the feast. The head (*ulu*), reserved for the chief, is cut off first; then in order the fore legs (*lima*), hind legs (*vae*), ribs (*ivi kayokayo*), back (*tua ivi*), and finally the hind quarter (*muliuuli*) are butchered. All these portions, together with the heart and liver, are again subdivided into the required number of smaller portions (*pona*). Save for the special portion for the chief, there is no reference in this division to rank or status.

Hens and roosters were introduced by a captain of a trading schooner whom the Pukapukans called Wuluwulu (Hairy-one) when he visited Pukapuka some time after the mission was well started in Samoa but before it was established in Pukapuka.

Chicken eggs play no important part in the diet today. It is probable that they were formerly left in the nests to hatch. At the present time eggs are used as gifts to visitors. We saw only one Pukapukan eating an egg, a child eating a hard-boiled egg. A great deal of trouble is taken over the raising of chickens, but at the present time they are rarely eaten. No household has enough chickens to have a chicken dinner very often. Only once, during the Christmas feasting, was a native family seen eating a chicken for a meal. A woman or a child chases the chicken to be killed, then hits the bird on the head until dead. Women or girls pluck the feathers, which are thrown into the sea. The body is singed, the head cut off, and the internal organs removed. The heart and liver are washed and baked on hot stones; the body is wrapped in banana leaves and baked in the oven. A live chicken, talo, and nuts are the usual gift feast sent to honor a friend. Only chickens found strangled in the trees or killed by the women's committee when found in the talo beds are regularly eaten by their owners.

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## House Platform

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Most dwelling houses and a few cook houses are built on a platform of coral rubble (*paepae*), several feet larger than the ground area of the house. The rubble is contained by a curbing of coral stones 8 to 10 inches high. Some houses are built on a secondary or upper platform of rubble limited by a coral or log curbing, which forms the house floor and extends about 12 inches beyond the walls of the house. Most houses in the copra settlements are built on a single low platform, gravel inside the house being retained by log curbings.

## Variations on Type House

Variations on the type house are found in the copra settlements.

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One house on the back beach of Uta conforms in all particulars to the *wakayamoa* style, save that the ridgepole is supported by two ridgeposts, which stand on the inner side of the end tiebeams. This house combines features from the *wakayamoa* type and the *wale atua* type. Most houses on exposed beaches are permanently covered on three sides with *takapau* mats or *pola* roof sheets fastened to wall poles. Only the leeward side of the house is left open between the ground and low eaves. In exposed situations, cook houses and dwelling houses of the *wakayamoa* type are provided with roof extensions (*taumata*) to cover ovens or to provide a roomy wind break. The rafters on the exposed side of the house are extended to about 18 inches or 2 feet from the ground and supported on subsidiary wall posts and a subsidiary wall plate. The extension is thatched, and permanent *takapau* mats are fastened to the outside of the subsidiary wall posts.

A small typical *wakayamoa* house, used as a sleep house in Yato village, measured 15 feet 8 inches long, 11 feet 7 inches wide; the eaves were 4 feet 6 inches from the ground; and the ridgepole was 9 feet 7 inches from the ground.

## Storage Houses

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Houses of the *wakayamoa* type used as storage houses (*wale takataka*) for nuts, fishing gear, or old canoe sections are often built far enough from the village to be safe from fire, but near enough to be easily visited. The floor of a *wale takataka* is used either as a place for lumber storage, or as a workshop for craft activities. According to the number of nut trees a man owns and the number of nuts he has to store, he possesses one or more *wale takataka*. Four houses was the usual number for an average family in former times, before copra was made.

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## Storage Platform

Nuts at the *takataka* stage are stored on a platform laid on the tiebeams and occupying the whole area marked out by the tiebeams. The lengths of wood forming the platform and the rafters are laid very close together to prevent the intrusion of thieves. Legitimate entry to the platform is made through one or two gates or hatch-

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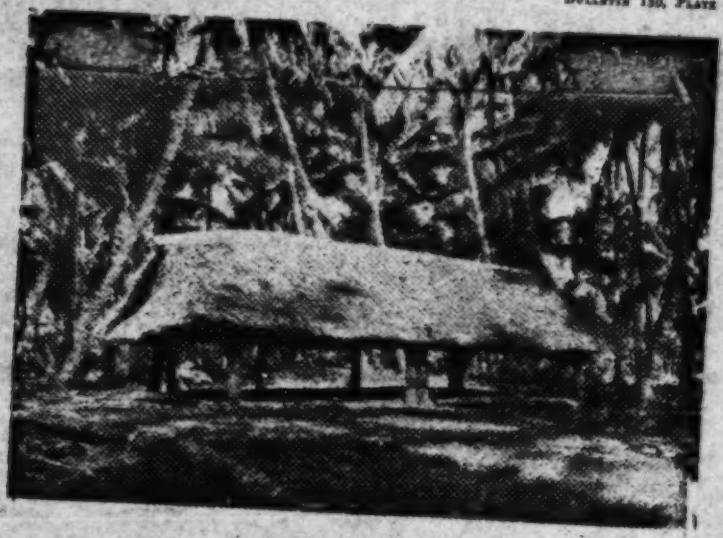

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*B*

HOUSE AND CEMETERY. *A*, LARGE HOUSE OF THE *WALE ATUA* TYPE AT THE PLACE MATALA IN THE RESERVE OF UTA, USED TODAY BY THE RESERVE GUARD; ONE ORIGINAL CORNER POST AND ONE SIDE POST HAVE BEEN REENFORCED BY NEW POSTS. *B*, VIEW OF THE CEMETERY OF TUA LINEAGE OF LOTO VILLAGE; THREE BOX GRAVES IN CENTER ARE CHRISTIAN; REMAINING GRAVES AND STONES ARE PRE-MISSIONARY AND SHOW VARIOUS STYLES OF STONEWORK; BECAUSE OF ITS PROXIMITY TO THE VILLAGE, MATURED COCONUTS ARE STORED HERE UNTIL NEEDED.